

Course Guide – Master Cognitive Science

Winter 2019/20

16.10.2019

Latest changes: Introduction to Perception and The Neural Basis of Vision removed from C2.

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Enrollment for Courses

Students in the first semester will be registered by the lecturers in the first session of each course. Advanced students (from the second semester on) are requested to register with the university's **VSPL**-system (info: vspl-support@rub.de) and should be aware of earlier VSPL-deadlines. Exceptions include the courses held by Wiskott and Schöner. Here, there will be **no VSPL-registration**, but a manual enrollment in the first session.

FIRST YEAR PROGRAM

Every student is strongly recommended to participate in the preparatory courses. Exceptions have to be approved by Dr. Pascale Willemsen (Sabrina.Coninx@rub.de) or by Prof. Dr. Albert Newen (albert.newen@rub.de). The course "Academic English" need not be passed by native speakers of English. The course "Biostatistics" need not be passed by students who have a standard BA in psychology.

Preparatory Courses

Biostatistics

SEMINAR
BIostatISTICS (119212)
JAMOL BAHROMOV

TERM: Winter 2019/20
MEETING TIME: September 19 – October 2: 11.00 – 14.30
ROOM: IA 0/69 (PC-Pool 2)

"Biostatistics" will cover the basic statistical methods used by researchers in the life sciences to collect, summarize, analyze, and draw conclusions from data. The topics include descriptive statistics, univariate statistical tests, and experimental design.

Academic English

SEMINAR

ENGLISH FOR MASTER COGNITIVE SCIENCE (251211)

CHANTAL ROSERE

TERM: Winter 2019/20
MEETING TIME: September 19 – October 2, 8.30 – 10.30
ROOM: SH 2/219

This course takes into account the particular needs of the students of the Master Program in Cognitive Science and covers all competencies that are necessary to study in English. It focusses on productive skills that will be practiced by means of discussions and short presentations on study-related issues. Using a task-based approach, listening, reading, writing and speaking skills will be trained intensively and social and intercultural competencies will be included as well. Authentic lectures and academic texts on chosen topics related to philosophy, psychology

and neuroscience will be used throughout the course.

The course will be accompanied by a Blackboard/Moodle component to enhance classroom teaching and self-study at home.

At the end of the course the participants have to write a final test that will comprise all four skills taught in class.

Literature: Materials compiled from a variety of sources will be used.

Mathematical Skills

SEMINAR

MATHEMATICS AND COMPUTERSCIENCE FOR MODELING (???)

JAN TEKÜLVE

TERM: Winter 2019/20
MEETING TIME: September 19 – October 2: 15.30 – 18.00
ROOM: IA 0/69 (PC-Pool 2)

The "Informatics and Mathematics" preparatory course will combine a hands-on introduction to programming in python with a revision of elementary mathematical concepts. The topics include data types, data structures, control structures and data visualisation on the programming

side and they will be applied to vector/matrix calculation, integration/differentiation of functions and differential equations.

A1. Introduction to Cognitive Science

A1.

A1. Introduction to Cognitive Science

OBLIGATORY FOR EVERY FIRST YEAR STUDENT

LECTURE & SEMINAR

INTRODUCTION TO COGNITIVE SCIENCE (LECTURE 030007)

PROF. ALBERT NEWEN, PROF. MARTIN BRÜNE,
PROF. ONUR GÜNTÜRKÜN, PROF. NIKOLAI AXMACHER,
PROF. NIKOL RUMMEL, PROF. MARKUS WERNING
PROF. TOBIAS SCHLICHT, PROF. GREGOR SCHÖNER,
PROF. LAURENZ WISKOTT, PROF. SEN CHENG

TERM:	Winter 2019/20
LECTURE:	Wednesday, 10 – 12 (First Meeting: 09.10.2019)
ROOM:	GA 04/187
SEMINAR:	Wednesday, 12 – 14 (First Meeting: 16.10.2019)
ROOM:	GABF 04/187 / first three meetings: NB 02/77
CP:	6

Attention:

- The time of the lecture will not vary but the time of the seminar will vary somewhat: The details of the seminar plan will be announced later.
- Lecture and Seminar #14 take place in LWL-Universitätsklinik Bochum, Alexandrinenstraße 1, 44791 Bochum

The lecture introduces the interdisciplinary field of cognitive science in combining philosophy, psychology, computational modeling and neurosciences. The course has the aim to deliver important basic knowledge from empirical sciences in the framework of theory formation. The credit points are delivered on the basis of a written examination and of some active work in the obligatory additional seminar.

The structure of the lecture:

1. Introduction: History of Cognitive Science
- 2 Basic Concepts in Cognitive Science
- 3 Cognitive Neuroscience of Perception
- 4 Modeling Vision
- 5 Consciousness of Perception
- 6 Development of Vision
- 7 Enacted and Embodied Cognition
- 8 Models of Motor Control
- 9 Cognitive Neuroscience of Emotion
- 10 Theories of Emotion
- 11 Psychology of Learning
- 12 Cognitive Neuroscience of Memory
- 13 Models of Learning and Memory
- 14 Social Cognition: Evolution, Development, Pathology

BM. Basic Methods

Students are expected to learn (at least) three out of four basic methods: If you have a BA in psychology, you can skip the “Experimental Psychological Lab” but have to pass the three other basic methods. If you have a BA in philosophy you can skip the course “Logic” but have to learn the other three methods. Some with a BA in neuroscience can skip method BM 4. All the other students need to study all basic methods. Exceptions can be made if someone can prove to have already studied the content of a course but need explicit approval by Dr. Pascale Willemsen (Pascale.Willemsen@rub.de) or by Prof. Dr. Albert Newen (albert.newen@rub.de).

One of the basic skills that need to be acquired during the program is the ability to write academic essays. This skill is not taught as one of the Basic Methods. It needs to be acquired during your course work. To do so, each student must write at least one essay in their first year of study, typically in C1 to C4. Students with little or no background in academic writing should write their essay in one of the courses that are sub-labelled “academic essay writing”. Those courses enable you to write academic texts as it will be needed for your master thesis, conference applications, or job applications.

BM1.

BM1. Experimental Psychology Lab

SEMINAR

EXPERIMENTAL PSYCHOLOGICAL LAB (119213)

DR. SIMON E. BLACKWELL

TERM:	Winter 2019/20
MEETING TIME:	Thursday 12 – 14 (First meeting: 10.10.2019)
ROOM:	10.10.2019: GA 04/187, afterwards: IA 1/163.
CP:	6

The Experimental Psychology Lab course aims at introducing the principles of experimental psychology. The participants will learn how to plan and conduct own experimental studies, and how to analyze the data.

As a result, all participants will write a first scientific report. The lab course will be held in small groups.

*SEMINAR***LOGIC AND PHILOSOPHICAL METHODOLOGY (030046)**

JUN. PROF. PETER BRÖSSEL

TERM:	Winter 2019/20
MEETING TIME:	Tuesday, 14 – 16 (First meeting: 08.10.2019)
ROOM:	GABF 04/358
CP:	6

The aim of this course is to provide an overview of the fundamental philosophical methods relevant for theory construction in cognitive science and in philosophy. Students will acquire (i) basic competences in classical logic and probability theory, (ii) an introduction to methods of concept clarification such as conceptual analysis, explication, and explicit and implicit definitions and (iii) insights into the basics of constructing, testing, and revising theories and models within cognitive science and philosophy. A part of the course will be devoted to practical exercises to consolidate the acquired competencies. A precondition for receiving ECTS points is 1.) to submit weekly homework regularly and 2.) to pass the written exam at the end of the course. The ECTS points can be with or without grade (dependent on the amount of work).

Literatur:

Theodor Sider, *Logic for Philosophy*, Oxford University Press, 2010.

Volker Halbach: *The Logic Manual*, Oxford University Press, 2010.

General Remark Concerning BM3 – Neural Networks

A basic course in neural networks is obligatory. The course of Prof. Schöner is the standard course for the students in Cognitive Science. If you are coming with more background in mathematics, you feel free to choose other offers. A BA in informatics or mathematics or an equivalent knowledge of mathematics and programming is required in this course. Students only have to pass one course in BM3.

BM3.

BM3. Neural Networks

LECTURE & EXERCISE

COMPUTATIONAL NEUROSCIENCE – NEURAL DYNAMICS

(310001 & 310011)

PROF. GREGOR SCHÖNER

TERM:	Winter 2019/20
LECTURE:	Thursday, 14 – 16 (First Meeting: 17.10. 2019)
ROOM:	NB 3/57
EXERCISE:	Thursday, 16.15 – 17.00 (First Meeting: 17.10.2019)
ROOM:	NB 3/57
CP:	6

This course is recommended as the standard course for BM3. A further background in informatics or mathematics is not required.

This course lays the foundations for a neurally grounded understanding of the fundamental processes in perception, in cognition, and in motor control, that enable intelligent action in the world. The theoretical perspective is aligned with ideas from embodied and situated cognition, but embraces concepts of neural representation and aims to reach higher cognition. Neural grounding is provided at the level of populations of neurons in the brain that form strongly recurrent neural networks and are ultimately linked to the sensory and motor surfaces.

The theoretical concepts on which the course is based come from dynamical systems theory. These concepts are used to characterize neural processes in strongly recurrent neural networks as neural dynamic systems, in which stable activation states emerge from the connectivity patterns within neural populations. These connectivity patterns imply that neural populations represent low-dimensional feature spaces. This leads to neural dynamic fields of activation as the building blocks of neural cognitive architectures. Dynamic instabilities induce change of attractor states from which cognitive functions such as detection, change, or selection decisions, working memory, and sequences of processing stages emerge. The course partially follows a textbook (*Dynamic Thinking—A primer on Dynamic Field Theory*, Schöner, Spencer, and the DFT research group. Oxford University Press, 2016), of which chapters will serve as reading material. Exercises will focus on hands-on simulation experiments, but also involve readings and the writing of short essays on interdisciplinary research topics. Tutorials on mathematical concepts are provided, so that training in calculus and differential equations is useful, but not a prerequisite for the course.

*LECTURE & EXERCISE***ARTIFICIAL NEURAL NETWORKS (310002+310012)**

PROF. SEN CHENG

TERM:	Winter 2019/20
LECTURE:	Monday, 16 – 18 (First Meeting: 07.10. 2019)
ROOM:	HNC 30
EXERCISE:	different options possible: (wed 10-12, 16-18; thu 10-12, 14-16, 16-18; Fr 12-14, 16-18)
ROOM:	TBA
CP:	6

Artificial neural networks (ANN) were inspired by the architecture and function of the brain. Nevertheless, their greatest strength is not that they are good models of the brain, but rather that they are powerful function approximators. Since the 1980's many types of ANN have been developed and tricks for training ANNs on data proliferated. Recent advances in computing hardware and the availability of large datasets have made it possible to train ANNs such that they perform better than humans, e.g. on image recognition. In this class, students will, firstly, gain a theoretical understanding of the principles underlying the methods applied to neural networks and, secondly, learn practical skills in implementing neural networks and applying them for data analysis.

Topics: optimization problems, regression, logistic regression, biological neural networks, model selection, universal approximation theorem, perceptron, MLP, backpropagation, deep neural networks, recurrent neural networks, LSTM, Hopfield network, Boltzmann machine

Software: python, numpy, scipy, matplotlib, scikit-learn, tensorflow

Moodle-Link: <https://moodle.ruhr-uni-bochum.de/m/enrol/index.php?id=22627>

Prerequisites: Calculus, linear algebra, statistics, programming.

*LECTURE***CLINICAL NEUROPSYCHOLOGY (112621)**

PROF. BORIS SUCHAN

TERM:	Winter 2019/20
MEETING TIME:	Tuesday, 10.00 – 12.00 (First Meeting: 08.10.2019) Exam: Tuesday, 24.03.2019, 10-12, HIA
ROOM:	IA 02/461
CP:	3

Aim of this lecture is to get an insight in the organization of the human brain, functional neuroanatomy and neuropsychology. Starting with an overview of basic methods used in neuroscience, the full brain starting at the occipital lobe and ending at the frontal lobe will be explored with respect to its functional organization. Beside functional organization, neuropsychological syndromes like neglect apraxia and amnesia will be discussed.

Literature:

Kolb & Wishaw: Fundamentals in human neuropsychology.

K.M. Hellmann & E. Valenstein (1993). Clinical Neuropsychology: Oxford University Press.

C. Topics Selection

C1.

C1. Social Cognition & Meta-Science

SEMINAR

RECENT DEBATES IN VIRTUE EPISTEMOLOGY (030065)

DR. REGINA FABRY

TERM:	Winter 2019/20
MEETING TIME:	Monday, 16 – 18 (First Meeting: 07.10.2019)
ROOM:	GA 04/187
CP:	6

How do we arrive at justified true beliefs? How do we acquire and update knowledge about states and processes in the world? Under what conditions can we take credit and be held responsible for our epistemic endeavours? In the last few decades, virtue epistemology has attempted to provide answers to these questions. Traditionally, virtue epistemologists have assumed that epistemic achievements – and failures – are ascribed to individuals who are largely independent from other people and cognitive tools (e.g., notational systems, notebooks, digital computers, smartphones). Recently, however, philosophers have investigated how our embodied interactions with our socio-culturally sculpted environment influence our normatively constrained processes of belief formation and knowledge acquisition. These investigations have been inspired by work on embodied, embedded, extended and enactive cognition and integrate contemporary epistemology and philosophy of cognition. The purpose of this seminar is to map this new field of philosophical research and to discuss various proposals about the implications of our active engagement with cognitive tools and other people for the ascription and evaluation of epistemic virtues.

In addition to the careful preparation of the all assigned readings and the active participation in the seminar, participants will be expected to give a presentation in English.

Literature

Carter, J. A., Clark, A., Kallestrup, J., Palermos, S. O., & Pritchard, D. (Eds.). (2018). *Extended epistemology*. Oxford, New York: Oxford University Press.

Carter, J. A., Clark, A., Kallestrup, J., Palermos, S. O., & Pritchard, D. (Eds.). (2018). *Socially extended epistemology*. Oxford, New York: Oxford University Press.

Turri, J., Alfano, M., & Greco, J. (2018). Virtue epistemology. In E. N. Zalta (Ed.), *Stanford encyclopedia of philosophy*. Retrieved from <https://plato.stanford.edu/archives/sum2018/entries/epistemology-virtue/>

C1.

Social Cognition & Meta-Science

SEMINAR

JOHN MCDOWELL'S „MIND AND WORLD“ (030087)

DR. ALFREDO VERNAZZANI

TERM:	Winter 2019/20
MEETING TIME:	Monday 10 – 12 (First Meeting: 07.10.2019)
ROOM:	GABF 04/358
CP:	6

John McDowell's «Mind and World» (1994) represents one of the most important works in the analytic tradition of philosophy. The book, which was drawn from the material prepared for the John Locke Lectures held at the University of Oxford in 1991, offers an incredibly rich and stimulating philosophical discussion of a very broad range of topics, from the conceptual nature of perceptual experience to the bounds of rationality, from man's place in the world to what it means to be human.

In this seminar, we will read and discuss McDowell's major work situating it within the tradition of analytic philosophy. In addition to the book, we will also read some extracts from works of other philosophers, like Evans and Sellars, that will be relevant for understanding the project carried out in «Mind and World».

For those interested in having an overview of the work, I recommend reading: J. McDowell "Précis of Mind and World" *Philosophical Issues* 7 (1996), pp. 231-239. DOI: 10.2307/1522909 [Titel anhand dieser DOI in Citavi-Projekt übernehmen] . The paper can be retrieved at the following address: <https://www.jstor.org/stable/1522909> .

Attendance is mandatory.

In order to get your credit points for the attendance you should either give a presentation (15-20 minutes) with handout plus prepare three written questions on a different meeting; or, write an essay (max. 6 pages) plus prepare three written questions on a different topic.

If you need to get a grade, you should write a term paper (Hausarbeit) on a topic previously agreed with me.

I would strongly recommend the students to buy a copy of the book. We will read the standard edition: J. McDowell, *Mind and World*, Harvard University Press (1996). Additional reading material will be made available on Moodle

C1.

Social Cognition & Meta-Science

SEMINAR

THEORIES OF CAUSALITY (030069)

BENEDIKT FAIT

TERM:	Winter 2019/20
MEETING TIME:	Wednesday 10 – 12 (First Meeting: 09.10.2019)
ROOM:	GAFO 04/609
CP:	6

From the very beginning causality has been a central topic in philosophy. Today's discussion mainly revolves around James Woodward's interventionist theory of causation (Making Things Happen, Oxford University Press, 2003). Many philosophers emphasize that the interventionist theory of causation has many advantages over other theories of causality, for instance, probabilistic theories, regularity theories, or causal process theories. In this seminar, which can be attended by advanced Bachelor (third year) and Master students, we will have a close look at different theories of causality in order to develop an own judgement whether the interventionist theory of causation indeed is as superior and elaborate as the current discussion suggests. In the first session (October 9) there will be an introduction to the topic. CPs can be achieved through presentations, essays, seminar papers, and oral exams (appointments for oral exams in the first two weeks after the lecture period, i.e. 03.02.–14.02.2020; all written texts have to be submitted no later than March 31, 2020). Texts will be provided via Moodle.

Beebe, H., C. Hitchcock, and P. Menzies (Eds.) (2012): The Oxford Handbook of Causation. Oxford/New York: Oxford University Press.

Woodward, J. (2003): Making Things Happen. New York: Oxford University Press..

C1.

Social Cognition & Meta-Science

*SEMINAR***REPRESENTATION IN COGNITIVE SCIENCE (030092)**

KRZYSZTOF DOLEGA

TERM:	Winter 2019/20
MEETING TIME:	Wednesday 14 – 16 (First Meeting: 09.10.2019)
ROOM:	GAFO 04/358
CP:	6

In this seminar, aimed at advanced BA and MA students with a background in Philosophy of Mind, Cognitive Science, Psychology, and Neuroscience we will study a recent book on the topic of mental representation written by Prof. Nick Shea (Oxford University). Mental representation has been a foundational topic in Cognitive Science and remains a highly contentious issue in all the related fields to this day. The book is open-access and presents a good overview of current debates and state of the art in research on representational capacities of biological and artificial systems.

ONE-WEEK INTERNSHIP
AUTONOMOUS ROBOTICS (310036)
PROF. GREGOR SCHÖNER

TERM:	Winter 2019/20
MEETING TIME:	2020, FEBRUARY 03.-07. (Preliminary meeting: 2019, 30.01.2020, 10.15h, NB 3/57)
ROOM:	NB 02/77
CP:	3

The practical course gives an introduction to mobile robotics with a focus on dynamical systems approaches. In the exercises, the computing environment Matlab is used to control e-puck miniature mobile robots, equipped with a differential drive, combined infrared/proximity sensors and a video camera. The course covers elementary problems in robot odometry, use of sensors and motor control. It then teaches basic dynamic methods for robot navigation, in which the robot's sensors are used for obstacle avoidance and approach to a target location.

Interested students who do not have experience in Matlab should attend the Matlab introduction of the lab exercise Computer Vision (typically the week before this course). Details about availability and credit points have to be clarified early via email.

Contact: mathis.richter@ini.rub.de

Enrollment: 01.12.2017-10.01.2020 e-mail mathis.richter@ini.rub.de

*LECTURE***LEFT BRAIN - RIGHT BRAIN (118111)**

PROF. ONUR GÜNTÜRKÜN

TERM:	Winter 2019/20
MEETING TIME:	Thursday, 12- 14 (First meeting: 10.10.2019) Exam: 02.04.2020, 12 - 14, HIA
ROOM:	IAFO 02/461
CP:	3

Most of our brain's processes are executed by different mechanisms in the left and the right hemisphere. Language, spatial orientation, motor control, emotional processing, face perception, and even the ability to comprehend the rhythm of a drum are guided by neural circuits that are differently tuned within the two hemispheres. These asymmetries of mental processing mean that damages of the human brain cannot be understood without a thorough understanding of asymmetries. The lecture aims at explaining the

current knowledge about the structure and the mechanisms of cerebral asymmetries by making use of highly interactive teaching methods.

*LECTURE***EPISTEMOLOGY OF PERCEPTION (030088)**

FRANCESCO MARCHI

TERM:	Winter 2019/20
MEETING TIME:	Thursday, 10 – 12 (First meeting: 10.10.2019)
ROOM:	GABF 04/609
CP:	6

In this seminar we focus on the recent book *The Rationality of Perception*, by Susanna Siegel. In the book Siegel argues for the novel view that perceptual experience can be assessed for rationality and justification just like reasoning. We will critically discuss the book, as well as selected papers that introduce the debate in which the book is located, shed further light on some of its aspects or raise problems for her view.

Siegel, S. (2012). "Cognitive Penetrability and Perceptual Justification*." *Nous* 46 (2): 201–22.

Siegel, S. (2017). *The Rationality of Perception*. Oxford University Press.

Siegel, S. and N. Silins. (2013). "The Epistemology of Perception." In Matthen, M. (Ed.) *The Oxford Handbook on the Philosophy of Perception*. Oxford University Press.

Siegel, S. (2018) reply to Endre Begby, Harmen Ghijzen, and Katia Samoilova. *Analysis Reviews*.

Siegel, S. (2018). "Perception as Guessing vs. Perception as Knowing: Replies to Clark and Peacocke". *Res Philosophica* 95(4), 761-784.

BLOCKSEMINAR
COGNITIVE ENHANCEMENT (118911)
LORENZA COLZATO

TERM:	Winter 2019/20
MEETING TIME:	25.10.2019 09:00h - 18:00h IA 02/452 26.10.2019 09:00h - 18:00h IA 02/460 27.10.2019 09:00h - 18:00h IA 02/460
CP:	3 or 6

This course is intended to review and discuss state-of-the-art developments in cognitive enhancement, covering issues like nutrition and food supplements (amino-acids); cognitive training (meditation and video games), physical exercise, music and brain simulation (transcutaneous vagus nerve stimulation and transcranial direct current stimulation) . The final grade will be based on individual student presentation, writing a scientific blog (example: <http://www.libcblog.nl/articles/vitamin-b-supplementation-against-dementia-and-cognitive-decline>) and writing a review chapter. The best blog will be published online. The course will be given as a block course over one weekend. The course language is English. All assignments will be checked for plagiarism. According to the assignments load, it is possible to choose between 3 (individual presentation and blog) or 6 ECTS (individual presentation, blog and review chapter).

Colzato, L.S. (2017). Theory-Driven Approaches to Cognitive Enhancement. New York: Springer

SEMINAR

THE EVOLUTION OF HIGHER COGNITIVE FUNCTIONS IN NON-HUMAN ANIMALS (112615)

DR. FELIX STRÖCKENS, SARAH VON EUGEN

TERM:	Winter 2019/20
MEETING TIME:	Thursday, 12 - 14 (First Meeting: 17.10.2019) Max. 24 participants
ROOM:	IA 1/91
CP:	3

Humans represent without a doubt the pinnacle in the evolution of higher cognitive functions. However, other non-human animals, even outside the primate order, also possess surprisingly complex forms of higher cognition. Within this seminar, selected studies on the occurrence of such complex cognitive skills will be presented by students, focusing on species like chimpanzees, parrots, crows and dolphins. Furthermore, the seminar aims to clear up with some of the myths about what animals are capable of and what is beyond their reach. In addition to behavioral data, the seminar will also deal with the question what the neuronal underpinnings of such skills are, and if there are any neuronal similarities between species expressing complex cognition. By dealing with these topics, participants of the seminar will get an overview of the cognitive abilities of non-human animals and learn that many of the cognitive skills considered unique to humans actually developed much earlier during evolution. The seminar will be held in English and students are required to give a talk on preselected literature.

*LECTURE & EXERCISE***MACHINE LEARNING: UNSUPERVISED METHODS
(310003 & 310013)**

PROF. LAURENZ WISKOTT

TERM:	Winter 2019/20
LECTURE:	Tuesday, 12.15 – 13.45 (First Meeting: 08.10.2019)
EXERCISE:	Tuesday, 10.30 – 12 (First Meeting: 15.10.2019)
ROOM:	GBCF 04/711
CP:	6

This course covers a variety of unsupervised methods from machine learning such as principal component analysis, independent component analysis, vector quantization, clustering, self-organizing maps, growing neural gas, Bayesian theory and graphical models. We will also briefly discuss reinforcement learning. The mathematical level of the course is mixed but generally high. The tutorial is almost entirely mathematical. Criteria for a certificate for the tutorial are an active participation, in particular presentation of selected exercises, and at least 50% in the final exam.

SEMINAR

**CONCEPTS: PHILOSOPHICAL AND PSYCHOLOGICAL
PERSPECTIVES: ACADEMIC ESSAY WRITING (030081)**
PROF. ALBERT NEWEN

TERM:	Winter 2019/20
MEETING TIME:	Tuesday, 10 – 12 (First Meeting: 08.10.2019)
ROOM:	GA 04/187
CP:	6

To have a clear view on concepts is an important desire of philosophers and psychologists, at least for those who agree that concepts are the building blocks of thoughts, and that they enable us to develop our complex human reasoning. Concerning the nature of concepts, there are a lot of important questions to deal with: (i) How can or should we characterize minimal epistemic conditions of concept possession? (ii) Are concepts innate and, if yes, to which extent? (iii) Where is the borderline between non-conceptual representations and conceptual representations? (iv) Do animals possess concepts? (v) How can we best account for conceptual changes in the ontogenetic development of humans? (vi) Can concepts be characterized by a unitary informational structure? Although we will discuss all these questions we want to focus on questions of the informational structure of concepts in humans. To discuss two main lines of research on concepts which can be characterized as empiricist and rationalist: Empiricist accounts of concepts claim that concepts can be fully analyzed in terms of a network of associated perceptual information (Barsalou 1999, Prinz 2004) while rationalist accounts of concepts argue that concepts are radically different in format from perceptual representations. The latter holds e.g. for Fodor's language of thought (Fodor 1975) but also for Dretske's theory of digital representations (Dretske 1983). To discuss further recent approaches of concepts in philosophy and psychology, we also will include relevant literature from the perspective of linguistics/semantic and developmental psychology (e.g. Susan Carey: *The origin of concepts*, 2011). A theory of concepts should furthermore account for conceptual transformations which take place during the ontogenetic development from 4 to 9 years of age (from characteristic-feature understanding to a definitional understanding of concepts). The aim of the seminar is to discuss the best candidates of theories of concepts which can be used to explain the foundation of basic cognition, rationality and thinking in an interdisciplinary way. Literature will be prepared in moodle.

Preparatory Reading:

Margolis, Eric and Laurence, Stephen, "Concepts", *The Stanford Encyclopedia of Philosophy* (Summer 2019 Edition), Edward N. Zalta (ed.), URL = <<https://plato.stanford.edu/archives/sum2019/entries/concepts/>>.

SEMINAR

LAWS OF NATURE AND GENERIC STATEMENTS (030086)

MATTHIAS UNTERHUBER

TERM:	Winter 2019/20
MEETING TIME:	Monday, 14 – 16 (First Meeting: 14.10.2019)
ROOM:	GA 04/187
CP:	6

The seminar will focus on laws of nature, generalizations as expressed in natural language, and their interconnection. We will address the following questions: (1) What are laws of nature? (2) How are generalizations expressed in natural language? (3) Which connection exists between generalizations in natural language and laws of nature, if any? Concerning (1), we will discuss the notion of *ceteris paribus* laws, i.e., laws of nature that explicitly allow for exceptions and their role in the special sciences (e.g., biology, chemistry, psychology). Regarding (2), we will focus on generic statements, statements such as birds can fly, which describe law-like regularities rather than particular matters of fact. On this point, the seminar will examine linguistic research on the semantics and pragmatics of generic statements. Concerning (3), we will discuss approaches which aim to utilize the semantics and pragmatics of generic statements for a better understanding of laws of nature in the special sciences.

Suggested Readings

Reutlinger, A., & Unterhuber, M. (2014). Thinking about Non-Universal Laws. *Erkenntnis*, 79(10), 1703–1713.

Leslie, S.-J., & Lerner, A. (2016). Generic Generalizations. In E. N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy* (Winter 2016 Edition). Retrieved from <https://plato.stanford.edu/archives/win2016/entries/generics/>

Mari, A., Beyssade, C., & Del Prete, F. (2013). Introduction. In A. Mari, C. Beyssade, & F. del Prete (Eds.), *Genericity* (pp. 1–92). Oxford: Oxford University Press.

READING SEMINAR

CONNEXIVE LOGIC (030094)

PROF. HEINRICH WANSING, JUN. PROF. DR. HITOSHI OMORI

TERM:	Winter 2019/20
MEETING TIME:	Thursday, 10 – 12 (First Meeting: 10.10.2019)
ROOM:	GABF 04/358
CP:	6

In this reading seminar, we intend to read and discuss some essential texts on connexive logic. Systems of connexive logic are contra-classical in the sense that they are not subsystems of classical logic and contain non-theorems of classical logic as valid theses, namely

Aristotle's Theses: $\sim(\sim A \rightarrow A)$, $\sim(A \rightarrow \sim A)$, and

Boethius' Theses: $(A \rightarrow B) \rightarrow \sim(A \rightarrow \sim B)$, $(A \rightarrow \sim B) \rightarrow \sim(A \rightarrow B)$.

Prerequisites for taking part in this seminar are some knowledge of propositional non-classical and modal logic and intrinsic interest in the topics of the seminar. For general information on connexive logic, see H. Wansing, Connexive Logic, in: The Stanford Encyclopedia of Philosophy (Fall 2014 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/fall2014/entries/logic-connexive/> and H. Omori and H. Wansing, Connexive logics: An overview and current trends, Logic and Logical Philosophy, published online July 2019, <https://apcz.umk.pl/czasopisma/index.php/LLP/article/view/LLP.2019.026/17958>.

In particular, we plan to read relevant parts of *Sociative Logics and their Applications, Essays by the Late Richard Sylvan*, Aldershot, Ashgate Publishers, 2000, and papers on logics of consequential implication, such as

Pizzi, C., 2004, "Contentability and the Logic of Consequential Implication", *Logic Journal of the IGPL*, 12: 561-579.

Pizzi, C., 2005, "Aristotle's Thesis between paraconsistency and modalization", *Journal of Applied Logic*, 3: 119-131.

Pizzi, C. and Williamson, T., 2005, "Conditional Excluded Middle in Systems of Consequential Implication", *Journal of Philosophical Logic*, 34: 333-362.

AM. Advanced Methods

Advanced methods are usually studied in the second semester. The following courses are exceptions, while the "fMRI"-course is only offered in the winter term.

Remarks for AM5

There is a laboratory lab class on molecular genetics offered within the semester break for students with a background knowledge in biology, molecular biology or psychobiology. The class will be held in German language. Participation in this basic lab class is required for attending the advanced lab class next summer semester.

Remarks for AM7

Students who already have basic knowledge in cognitive neuroscience can choose to learn the "fMRI"-technique in the first semester. Necessary background: basic knowledge in cognitive neuroscience. The FMRI-seminar must be integrated into the course program during the first or the third semester; in the case you want to learn the FMRI –technique in the first semester, an individual application for the course is necessary: [N.N.](#) ***t.b.a.

Students who would like to acquire basic background knowledge in the field of neuroimaging, are recommended to attend the seminar "Bildgebende Verfahren in der Neuropsychologie" (held in german language) from section D1 (lecturer: Prof. Boris Suchan).

Further advanced methods can be found in the program from the last summer semester on our webpage: http://www.ruhr-uni-bochum.de/philosophy/mcs/program_courses.html. They will again be offered in the upcoming summer semester.

*BLOCKSEMINAR***COGNITIVE ENHANCEMENT (118911)**

LORENZA COLZATO

TERM:	Winter 2019/20
MEETING TIME:	25.10.2019 09:00 - 18:00 IA 02/452 26.10.2019 09:00 - 18:00 IA 02/460 27.10.2019 09:00 - 18:00 IA 02/460
CP:	t.b.a.

Not recommended for first semester students!

This course is intended to review and discuss state-of-the-art developments in cognitive enhancement, covering issues like nutrition and food supplements (amino-acids); cognitive training (meditation and video games), physical exercise, music and brain simulation (transcutaneous vagus nerve stimulation and transcranial direct current stimulation) . The final grade will be based on individual student presentation, writing a scientific blog (example: <http://www.libcblog.nl/articles/vitamin-b-supplementation-against-dementia-and-cognitive-decline>) and writing a review chapter. The best blog will be published online. The course will be given as a block course over one weekend. The course language is English. All assignments will be checked for plagiarism. According to the assignments load, it is possible to choose between 3 (individual presentation and blog) or 6 ECTS (individual presentation, blog and review chapter).

Colzato, L.S. (2017). Theory-Driven Approaches to Cognitive Enhancement. New York: Springer

SEMINAR

MOLEKULARGENETISCHES LABORPRAKTIKUM (118 514)

DR. DIRK MOSER

TERM:	Winter 2019/20
MEETING TIME:	Blockseminar: during semesterbreak (Preliminary Meeting: 14.10.2019, 13.30 – 14, IB 5/103)
ROOM:	IB 5/103
CP:	t.b.a.

Language of the lab class is **GERMAN**.

Das Grundpraktikum „Molekulare Psychologie“ soll interessierten Studierenden die Schnittmenge zwischen Psychologie und Biologie experimentell begreifbar machen. Hierzu wird jeder PraktikumssteilnehmerIn aus eigenem Blut DNA extrahieren und diese im Verlauf der Woche auf verschiedene, in der psychobiologischen Forschung prominente Genvarianten überprüfen. Hierzu finden eine Vielzahl molekularbiologischer Methoden Anwendung. Praktikumsbegleitend werden molekulare Grundlagen sowie experimentelle Möglichkeiten, sowie die Ergebnisse der eigenen praktischen Versuche in Spezialvorträgen präsentiert und diskutiert.

Vorbesprechung ist am 20.10.2016 um 16:00 Uhr

Der einwöchige Kurs (Mo-Fr 9:00 bis 13:00) findet im Anschluss an das Wintersemester in den Semesterferien statt und ist auf 6 Teilnehmer beschränkt.

Teilnahmevoraussetzung: gute bis sehr gute Kenntnisse in Biologie/Molekularbiologie/Psychobiologie.
Praktikumssprache ist Deutsch.

AM7.

AM7. fMRI Training

PRACTICAL COURSE/EXERCISE

NEUROPSYCHOLOGICAL METHODS: FMRI (118512)

PROF. NIKOLAI AXMACHER

TERM:	Winter 2018/19
MEETING TIME:	Monday, 14 – 16 (First Meeting: 14.10.2019)
ROOM:	IA 1/87
CP:	t.b.a.

(see remarks for AM7 on page 23)

Practical course and seminar have to be attended both together. They cannot be taken individually. Please also see remarks for AM7 above.

This seminar can only be taken in combination with the theoretical course (course number: 118518). You must participate in both courses to get credit points. The aim of this course is to learn how the fMRI can be used to acquire new scientific knowledge. The participants shall measure and analyze fMRI data and present their results in a scientific manner. To pass this course, participants must be present on at least 2/3 of the seminar and participate in practical scanning sessions as an experimenter. This course is designed specifically for students of the cognitive science master program.

Please register online if interested.

AM7.

fMRI Training

SEMINAR

NEUROPSYCHOLOGICAL METHODS: FMRI (118 518)

PROF. NIKOLAI AXMACHER

TERM:	Winter 2018/19
MEETING TIME:	Monday, 10 – 12 (First Meeting: 14.10.2019)
ROOM:	IA 1/87
CP:	t.b.a.

Practical course and seminar have to be attended both together. They cannot be taken individually.

Please also see remarks for AM7 above.

This seminar can only be taken in combination with the practical course (course number: 118519). You must participate in both courses to get credit points. The aim of this course is to learn how the fMRI can be used to acquire new scientific knowledge. The participants shall measure and analyze fMRI data and present their results in a scientific manner. To pass this course, participants must be present on at least 2/3 of the seminar and participate in practical scanning sessions as an experimenter. This course is designed specifically for students of the cognitive science master program.

Please register via online registration if interested.

D1. Free Selection

There is one free selection module in the program which can take any course of the program you passed and do not need to complete the modules. If there is a problem to complete a module, in principle, the courses in the free selection module can be used for obligatory modules. But this has to be explicitly confirmed in advance by Dr. Pascale Willemsen or Prof. Albert Newen. Students are only allowed to take maximally 3 German courses in the whole program up to maximally 12 credit points.

D1.

D1. Free Selection

LECTURE

STRESS (117031)

PROF. OLIVER WOLF

TERM:	Winter 2019/20
MEETING TIME:	Monday, 12 – 14 (First Meeting: 14.10.2019) Exam: Monday, 2020, March 23, 14 – 16 in HIA
ROOM:	HIA
CP:	t.b.a.

Ursachen und Folgen von Stress werden aus einer psychologischen Perspektive beleuchtet. Es werden sowohl Aspekte der biopsychologischen Grundlagenforschung als auch Aspekte der anwendungsbezogenen Forschung (Gesundheitspsychologie, Klinische Psychologie, Wirtschaftspsychologie) berücksichtigt. Die Vorlesung gibt einen Überblick über aktuelle Forschungsthemen der Stressforschung. Folgende Fragen werden adressiert: Was ist Stress? Was ist ein Stressor? Welche psychischen und biologischen Veränderungen treten in Reaktion auf Stress auf? Wie kann man sich die große interindividuelle Varianz im Stresserleben erklären? Wann ist Stress adaptiv und unter welchen Umständen kann er negative Konsequenzen haben (maladaptiv sein)? Welche Auswirkungen hat Stress auf affektive und kognitive Prozesse? Wie wird unser Körper und unser Gehirn durch Stress beeinflusst? Neben psychologischen Ansätzen werden Theorien und Befunde aus den Forschungsfeldern der Psychoneuroendokrinologie, der Psychoneuroimmunologie und den affektiven und kognitiven Neurowissenschaften besprochen.

LECTURE
LERNEN (112231)
PROF. ONUR GÜNTÜRKÜN

TERM:	Winter 2019/20
LECTURE:	Thursday, 16.00 – 18.00 (First Meeting: 17.10.2019) Exam: Wednesday, 01.04.2020, 10 – 12 in HIA
ROOM:	HIA
CP:	3

Die Vorlesung soll einen Überblick über die Lerngesetze, ihre Anwendungsmöglichkeiten in therapeutischen Verfahren und die hirnhysiologischen Grundlagen von Lern- und Gedächtnisprozessen bieten. Soweit möglich, sollen alle drei Aspekte immer zusammen besprochen werden; z.B. werden bei der klassischen Konditionierung zuerst die historischen Entwicklungslinien, dann die Details des eigentlichen Lernphänomens, dann die therapeutischen Anwendungen (z.B. systematische Desensibilisierung) und anschließend die synaptischen Mechanismen referiert.

Begleitend zur Vorlesung "Lernen" von Prof. Dr. Güntürkün soll dieses Seminar verschiedene Fragen zur wissenschaftlichen Auseinandersetzung mit dem Thema Lernen vertiefen. Dazu werden die Studierenden wissenschaftliche Artikel und Kapitel aus Lehrbüchern in Referatsform vortragen.

Literatur:

Als Vorbereitung ist folgendes Buch zu empfehlen: The Principles of Learning and Behaviour, Michael Domjan, 7. Auflage, 2015

*SEMINAR***JOURNAL CLUB: NEUROPSYCHOANALYSE (118915)**

PROF. NIKOLAI AXMACHER

TERM:	Winter 2019/20
MEETING TIME:	Thursday, 16 – 18 (First Meeting: 10.10.2019)
ROOM:	IA 1/87
CP:	t.b.a.

In Analogie zu den Kognitiven Neurowissenschaften - der Untersuchung der neuronalen Korrelate kognitiver Prozesse - wurden in den letzten Jahren auch Konzepte der Psychoanalyse mit bildgebenden Methoden untersucht. Dieses Seminar vermittelt einen Überblick über diese Studien. Dabei werden aktuelle Untersuchungen zu zentralen psychoanalytischen Konzepten (Verdrängung, Konversion, Träume, Traumatisierung...), aber auch Studien zu den Mechanismen der psychodynamischen Psychotherapie sowie psychodynamische Konzeptualisierungen neuropsychologischer Symptome vorgestellt und diskutiert. Ein zentrales Lernziel dieser Veranstaltung - und damit auch Grundlage für die erfolgreiche Teilnahme und Leistungsbewertung - ist die regelmäßige aktive Beteiligung am wissenschaftlichen Diskurs. Daher ist eine regelmäßige Anwesenheit im Umfang von mindestens zwei Dritteln der Termine notwendig

*SEMINAR***BILDGEBENDE VERFAHREN IN DER NEUROPSYCHOLOGIE (118513)**

PROF. BORIS SUCHAN

TERM:	Winter 2019/20
MEETING TIME:	Wednesday, 14-16 (First meeting: 16.10.2019)
ROOM:	IA 1/87
CP:	3

In diesem Seminar sollen die für den/die Neuropsychologen/in relevante Bildgebende Verfahren vorgestellt werden. Hierbei werden sowohl die theoretischen Grundlagen, als auch die Methoden in der Versuchsplanung und Auswertung vorgestellt. Anhand von ausgewählten Arbeiten werden die Kenntnisse in Methode und Anwendung vertieft. Folgende bildgebende Verfahren, deren Anwendung und Auswertung werden vorgestellt: Positronen Emissions Tomographie (PET), Single Photonen Emissions Computer Tomographie (SPECT), Magnet Resonanz Tomographie/Funktionelle Magnet Resonanz Tomographie, Magnet Enzephalographie (MEG), Transkranielle Magnetstimulation (TMS). Statistical Parametric Maps (SPM). Es ist geplant, eine Auswertung eines Experimentes exemplarisch während des Seminars durchzuführen. Eventuelle praktische Sitzungen (MRT-Scans) sind je nach Terminplanung auch möglich. Ein zentrales Lernziel dieser Veranstaltung - und damit auch Grundlage für die erfolgreiche Teilnahme und Leistungsbewertung - ist die regelmäßige aktive Beteiligung am wissenschaftlichen Diskurs. Daher ist eine regelmäßige Anwesenheit im Umfang von mindestens zwei Dritteln der Termine notwendig.

Eine Literaturliste ist zu Beginn des Seminars erhältlich

*LECTURE***SOZIALPSYCHOLOGIE II (112321)**

PROF. WILHELM HOFMANN

TERM:	Winter 2019/20
MEETING TIME:	Thursday, 10.00 – 12.00 (First Meeting: 17.10.2019) Exam: Thursday, 26.03.2020, 10 – 12, HIA
ROOM:	HZO 40
CP:	3

Max. 5 participants

Wie erfahren wir, wer wir sind? Brauchen Menschen eher Freiheit oder eher Orientierung? Was ist das Unbewusste? Wie gehen wir mit Misserfolgen um und wie erreichen wir unsere Ziele? Wie können wir uns motivieren, etwas zu tun? Wie überwinden wir Hindernisse? Neigen alle Menschen dazu, andere zu diskriminieren? Haben wir alle aggressive Anteile? Wie entsteht Aggression? Und wie entstehen Konflikte zwischen Gruppen? Wie kann man Zivilcourage fördern? Fördert Brainstorming die Kreativität oder behindert sie sie?

In der Vorlesung zur Sozialpsychologie 2 wollen wir die Inhalte der Vorlesung zur Sozialpsychologie 1 vertiefen. Zudem sollen Anwendungsaspekte diskutiert und Forschungsmethoden anhand von Experimenten dargestellt werden. Brücken zur soziologischen, philosophischen, konsumenten-psychologischen, organisationspsychologischen, emotionspsychologischen, motivationspsychologischen und wirtschaftspsychologischen Forschung werden geschlagen, Überschneidungen werden diskutiert.

*VORLESUNG***GRUNDLAGEN DER NEURO- UND SINNESPHYSIOLOGIE (112241)**

PROF. NIKOLAI AXMACHER

TERM:	Winter 2019/20
MEETING TIME:	Wednesday, 8 – 10 (First meeting: 16.10.2019) Exam: Friday, 27.03.2020, 10 – 12, HIA
ROOM:	HIA
CP:	3

Ziel der Vorlesung ist es, ein Grundverständnis der Informationsverarbeitung im ZNS und der Sinnesorgane zu übermitteln. Neben den anatomischen Grundlagen im Aufbau von Nervenzellen werden auch das Verhalten, d.h. die Erregungsleitung und -übertragung, sowie die Verrechnungsprozesse an Synapsen näher betrachtet. Hierbei soll auch ein Schwerpunkt auf die synaptische Plastizität gelegt werden. Auch die in der Psychologie und Medizin eingesetzten diagnostischen Verfahren, wie z. B. das EEG, sollen erläutert werden.

VORLESUNG

MOTIVATION UND VOLITION (112271)

DR. MARLIES PINNOW

TERM:	Winter 2019/20
MEETING TIME:	Monday, 16 – 18 (First meeting: 14.10.2019) Exam: Tuesday, 31.03.2020, 10 – 12, 2019, HIA
ROOM:	HIA
CP:	3

Die Vorlesung führt in das Gebiet der Motivations- und Volitionspsychologie ein. In einem ersten Abschnitt wird in einem kurzen Überblick über die Forschungs- und Problemgeschichte, eine Gegenstandsbestimmung der Motivationspsychologie und ihrer zentralen Fragestellungen erarbeitet. Darüber hinaus werden zentrale Methoden der Motivationsforschung erörtert. Auf dieser Basis werden dann einzelne Verhaltenssysteme wie Hunger, Neugier, Angst, Leistung, Aggression diskutiert. Spezifische Ansätze wie Attributionstheorien, Erwartungs- X Wert-Modelle, Instrumentalitätstheorie etc. werden innerhalb der Motivsysteme oder als Exkurse behandelt. Den Abschluss bildet eine Erörterung handlungstheoretischer und volitionaler Probleme zielgerichteten Verhaltens.

The course will be held in German. Students may choose to take the exam in English. The recommended literature for those following this option is:

Heckhausen J. & Heckhausen, H. (2010). *Motivation and Action*. Cambridge: Cambridge University Press.

Schmalt, H.-D. & Langens, T. A. (2009): *Motivation* (4. vollständig überarbeitete Auflage). Stuttgart: Kohlhammer
Heckhausen, J. & Heckhausen, H. (2010): *Motivation und Handeln* (4. Auflage). Berlin: Springer.

SEMINAR

**MEIN KÖRPER UND ICH – WAS UNS BEWUSSTSEINS-
PHÄNOMENE ÜBER DIE WAHRNEHMUNG UNSERES SELBST
ERZÄHLEN (112616)**

PROF. MARTINA MANNIS

TERM:	Winter 2019/20
MEETING TIME:	Thursday, 14 – 16 (First Meeting: 24.10.2019)
ROOM:	IA 1/157
CP:	3 CP

Die Kognitive Psychologie zeigt uns, dass das Bild, welches wir uns von der Welt machen, eine Interpretation unseres Gehirns ist. Dies gilt auch für die bewusste Wahrnehmung unseres Selbst. Der portugiesische Dichter Fernando Pessoa beschreibt dies so „Meine Seele ist ein verborgenes Orchester; ich weiß nicht, welche Instrumente, Geigen und Harfen, Pauken und Trommeln es in mir spielen und dröhnen lässt. Ich kenne mich nur als Symphonie“. Basierend auf Referaten, aber auch in hoffentlich kontroversen Diskussionsrunden werden wir in diesem Seminar verschiedene Bewusstseinsphänomene besprechen und so bizarre Phänomene wie Phantomglieder, Out-of-Body-Experience, Anosognosie oder Cotard Syndrom kennenlernen. Wir wollen hierzu das biopsychologische Wissen beleuchten um zu verstehen, wie das Gehirn ein Bild unseres Selbst erzeugt.

Literatur wird zu Beginn des Seminars bekannt gegeben. Ein populärwissenschaftliches Buch zum Thema ist: Vilaynur S. Ramachandran, Sandra Blakeslee. Die blinde Frau, die sehen kann: Rätselhafte Phänomene unseres Bewusstseins. Taschenbuchausgabe rororo;

*BLOCKSEMINAR***BEHAVIORAL ECONOMICS (IN GERMAN) (117423)**

PROF. WILHELM HOFMANN

TERM:	Winter 2019/20
MEETING TIME:	Friday 08.11.2019, 14 – 15:30, IA 02/460 (Preliminary Meeting) Friday, 06.12.2019, 14 – 18, IA 02/452 Saturday, 07.12.2019, 9 – 16, IA 02/452 Friday, 13.12.2019, 14 – 18, IA 02/460
CP:	3 CP

Max. 5 Participants

Behavioral Economics („Verhaltensökonomie“) ist ein Teilgebiet im Schnittpunkt von Wirtschaftswissenschaft und Psychologie. Sie beschäftigt sich mit menschlichem Verhalten in wirtschaftlichen Situationen. Dabei werden Situationen untersucht, in denen Menschen im Widerspruch zur Modell-Annahme des Homo oeconomicus, also des rationalen Nutzenmaximierers, agieren. Ziel des Seminars ist es, in das Feld einzuführen und aktuelle Kernfragen und Forschungsthemen näher kennen zu lernen. Der Schwerpunkt wird dabei auf psychologischen Anwendungen (z.B. Feldexperimente; Interventionen; „Nudging“) in verschiedenen Bereichen (z.B. Klimaschutz, Konsumentenentscheidungen, Gesundheitsverhalten) liegen, wenn auch Grundlagenforschung mit einbezogen werden wird. Dabei werden auch eigene Nudging-Ideen entwickelt und vorgestellt.

SECOND YEAR PROGRAM

I. Interdisciplinary Research Module

If a student wants to use a course from C1 to C4 as a substitute for I1 to I4, this is possible if the substitute course is closely connected with the master thesis project.

I1.

I1. Cognitive Philosophy

COLLOQUIUM

PHILOSOPHY AND THE COGNITIVE SCIENCES – PREPARATION OR PROGRESS CONCERNING A MASTER OR PHD-THESIS (030127)

PROF. ALBERT NEWEN, DR. BEATE KRICKEL

TERM:	Winter 2019/20
MEETING TIME:	Thursday, 14 – 16 (First Meeting: 10.10.2019)
ROOM:	GA 04/187
CP:	6

The colloquium will offer regular presentations mainly from M.A., PhD-students and postdocs from Bochum with some talks from external guests. The presentations will all be in the general domain of theoretical philosophy and cognitive sciences. The presentations should ideally but not necessarily have some interdisciplinary dimension such that perspectives from philosophy, psychology, epistemology and neurosciences can be systematically interconnected. The aim of the colloquium is to offer a platform for discussion of ongoing research and to support the education of students at the Master and PhD-level. Students who are accepted for a presentation in this seminar will receive a special training in preparing presentations in English.

M.A. and PhD-students who are interested in presentations should write an email to both organizers (albert.newen@rub.de and beate.krickel@rub.de) and come to the first meeting. The program of the semester will be fixed then. M.A.-students can receive 4 CP for a presentation in the colloquium (in the case of an additional essay, M.A. students can receive 6 CP).

Language: The presentations in the colloquium and the discussion will be in English. Questions can be raised in German but will then be translated for the whole audience.

*COLLOQUIUM***EXTRA RESEARCH COLLOQUIUM "METAPHILOSOPHY AND
EXPERIMENTAL PHILOSOPHY" (030128)**

DR. JOACHIM HORVATH

TERM:	Winter 2019/20
MEETING TIME:	Wednesday, 17 – 19 (First Meeting: 09.10.2018)
ROOM:	GAFO 04/619
CP:	6

In this research colloquium, we will discuss current topics from metaphilosophy and experimental philosophy, broadly construed. The colloquium will also host talks by a number of external guests, some of which will be leading experts in their field. Students at the master or doctoral level will be given the opportunity to present their work in English.

*COLLOQUIUM***RESEARCH COLLOQUIUM GENETIC PSYCHOLOGY (118913)**

PROF. ROBERT KUMSTA

TERM:	Winter 2019/20
MEETING TIME:	Monday, 16 – 18 (First Meeting: 14.10.2019)
ROOM:	IA 1/161
CP:	3

This course serves to present the current research work and qualification theses (Bachelor, Master theses, PhD project) of the Genetic Psychology unit. Moreover, invited scientists will present the latest research results in the area of Genetics, Epigenetics and Development Psychobiology. An overview of the topics and speakers will be announced with posters and on the Homepage.

*COLLOQUIUM***RESEARCH COLLOQUIUM NEUROPSYCHOLOGY (118916)**

PROF. NIKOLAI AXMACHER

TERM:	Winter 2019/20
MEETING TIME:	Thursday 14 – 16 (First meeting: 10.10.2019)
ROOM:	IB 6/127
CP:	3

The content of this course is to present current research work in the spheres of neuropsychology and talks by guest professors on clinical neuropsychological topics. The schedule with information on the topics and speakers will be posted on the information board and at <http://www.ruhr-uni-bochum.de/neuropsych/> before the start of the WS. The central educational goal of this course – and as such the basis for a successful participation and awarding of credits – is regular active contribution to the scientific discourse. Therefore, regular attendance in the scope of at least 2/3 of the sessions is required.

*COLLOQUIUM***SCIENTIFIC COLLOQUIUM: COGNITIVE PSYCHOLOGY AND
PSYCHONEUROENDOCRINOLOGY (115113)**

PROF. OLIVER T. WOLF

TERM:	Winter 2019/20
MEETING TIME:	Tuesday, 16.00 – 18.00 (First Meeting: 15.10.2019)
ROOM:	IA 02/445
CP:	t.b.a.

In this forum, scientific projects (i.e. Master and PhD projects) of the Cognitive Psychology work group will be presented. The main focus is on experimental stress studies. Here we will try to answer the questions, “what makes us stressed” and “how does stress affects our cognitive skills”. In addition, invited guests from our faculty, from other faculties of the RUB and from other universities world wild will present their current research findings on topics that relate to cognitive psychology or psychoneuroendocrinology.

An overview of the schedule will be available on the AE homepage at the beginning of the semester.

The seminar will be held in the English language.

Students in the 3rd semester who think about conducting their master thesis with our AE can participate.

*LECTURE & EXERCISE***MACHINE LEARNING: UNSUPERVISED METHODS****(310003 & 310013)**

PROF. LAURENZ WISKOTT

TERM:	Winter 2019/20
LECTURE:	Tuesday, 12 – 14 (First Meeting: 08.10.2019)
EXERCISE:	Tuesday, 09:30 – 12 (First Meeting: 15.10.2019)
ROOM:	NB 3/57
CP:	6

This course covers a variety of unsupervised methods from machine learning such as principal component analysis, independent component analysis, vector quantization, clustering, self-organizing maps, growing neural gas, Bayesian theory and graphical models. We will also briefly discuss reinforcement learning. The mathematical level of the course is mixed but generally high. The tutorial is almost entirely mathematical. Criteria for a certificate for the tutorial are an active participation, in particular presentation of selected exercises, and at least 50% in the final exam.

*SEMINAR***JOURNAL CLUB "LEARNING AND MEMORY" (310026)**

PROF. SEN CHENG

TERM:	Winter 2019/20
MEETING TIME:	Tuesday, 12 – 13:30 (First Meeting: 08.10.2019)
ROOM:	GA 04/187
CP:	3

We will focus on the neural basis of learning and memory at the systems level. In each session a journal article will be presented by one participant and discussed by all participants. The articles will be selected particularly in the areas of spatial and episodic memory. They will focus on the functional role of the mammalian hippocampus in these processes and include a diverse set of approaches: electrophysiology, imaging, computational modeling, and robotics.

Contact: Prof. Sen Cheng, NB 3/33, sen.cheng@rub.de

Capacity: max. 15 students

*COLLOQUIUM***BIOPSYCHOLOGY RESEARCH COLLOQUIUM (118914)**

PROF. ONUR GÜNTÜRKÜN

TERM:	Winter 2019/20
MEETING TIME:	Monday, 13.00 – 15.00 (First Meeting: 07.10.2018)
ROOM:	IB 6/127
CP:	3

The research colloquium is open to all employees and graduate students of the Biopsychology department. The aim is to present and discuss their research. In addition external guests are invited to give talks on different aspects of biopsychology. You can have a look at the schedule at the department's information board and our homepage: <http://www.bio.psy.ruhr-unibochum.de/>

For earning CP: obligatory essay on one of the presented topics

*COLLOQUIUM***THEMEN DER KOGNITIVEN NEUROWISSENSCHAFT (118 711)**PROF. ONUR GÜNTÜRKÜN, PROF. OLIVER WOLF,
PROF. NIKOLAI AXMACHER

TERM:	Winter 2019/20
MEETING TIME:	Friday, 10.00 – 12.00 (First meeting: 18.10.2019)
ROOM:	IA 1/87
CP:	3

In dieser Veranstaltung werden laufende Forschungsprojekte, die sich für eine M.Sc. Arbeit eignen, vorgestellt. Ein zentrales Lernziel dieser Veranstaltung - und damit auch Grundlage für die erfolgreiche Teilnahme und Leistungsbewertung - ist die regelmäßige aktive Beteiligung am wissenschaftlichen Diskurs. Daher ist eine regelmäßige Anwesenheit im Umfang von mindestens zwei Dritteln der Termine notwendig.

Voraussetzungen: Interesse an neurowissenschaftlicher Master-Arbeit

Literatur: wird in der Veranstaltung bekannt gegeben.